Test 2

1. A centerpoint design appears below.

A	B	Response
-1	-1	67
1	-1	74
-1	1	65
1	1	69
0	0	68
0	0	67
0	0	68
0	0	71

   (a) Enter the data in Minitab and analyze it: test for effects, analyze any interactions, and test for curvature. What do you think the response surface looks like?

   (b) Construct a main effects model. If you wanted to decrease the mean response, which direction, generally speaking, would you look?

   (c) What is your estimate of experimental error (express it as a standard deviation, rather than a variance)? What sample size would you need to detect each of the observed values of A, B and AB from your experiment above?

2. A replicated experiment for 4 2-level factors appears below.

A	B	C	D	Response
-1	-1	-1	-1	44.8, 44.7
1	-1	-1	-1	43.0, 41.2
-1	1	-1	-1	43.0, 42.7
1	1	-1	-1	42.0, 42.8
-1	-1	1	-1	40.4, 45.1
1	-1	1	-1	44.8, 42.1
-1	1	1	-1	42.8, 44.3
1	1	1	-1	41.6, 42.5
-1	-1	-1	1	50.5, 51.6
1	-1	-1	1	45.0, 44.4
-1	1	-1	1	47.9, 50.6
1	1	-1	1	44.4, 43.9
-1	-1	1	1	51.4, 47.4
1	-1	1	1	45.0, 44.3
-1	1	1	1	48.3, 51.2
1	1	1	1	44.3, 45.6

   (a) Analyze the data as a replicated design. This analysis will serve as a baseline.

   (b) Compute averages for the above design and analyze the averages. Does this analysis overlook any important effects detected by the analysis in (a)?

   (c) Analyze the first and second responses separately. Are your results similar to the fully-replicated analysis in (a)?

   (d) Select the runs for which ABCD=-1 (I=-ABCD) and analyze the averages from these 8 runs. Repeat for the runs for which ABCD=1 (I=ABCD). Are results consistent with the fully-replicated analysis in (a)?